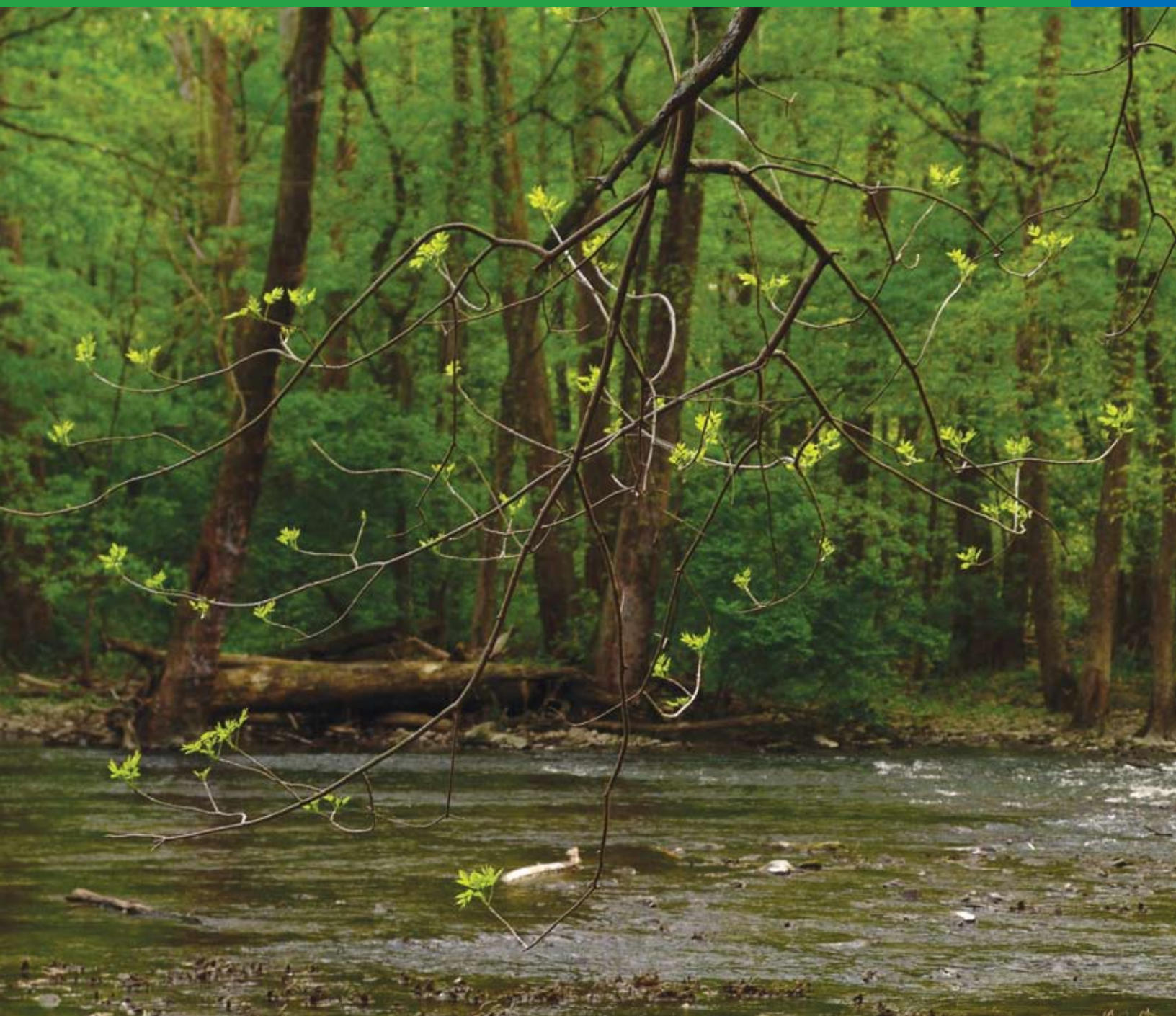




# NRMRL STRATEGIC PLAN

National Risk Management Research Laboratory

September 2006



*NRMRL's mission is to advance scientific and engineering solutions that enable EPA and others to effectively manage current and future environmental risks.*

# **NRMRL STRATEGIC PLAN**

**National Risk Management Research Laboratory  
Office of Research and Development  
United States Environmental Protection Agency**

**September 2006**





DIRECTOR OF THE  
NATIONAL RISK MANAGEMENT RESEARCH LABORATORY

Dear Colleagues:

The founding of the National Risk Management Research Laboratory (NRMRL) in 1995 fulfilled a great vision to create an enhanced Office of Research and Development (ORD) within the United States Environmental Protection Agency (EPA)—one that has the capacity not only to assess risks to public health and the environment, but to create the engineering and scientific solutions necessary to meet the established goals set forth in policy, regulation, and voluntary programs.

WOW! No one could have predicted the impact NRMRL would have on the nation and the globe. We have taken on many unique challenges and delivered outstanding results. NRMRL has some amazing success stories to tell and I enjoy hearing and talking about them.

We lead the world in providing practical guidance for remediation of hundreds of Superfund and other contaminated sites. Our researchers provide the scientific knowledge to better understand how to remediate contaminated ground water and assess vapor intrusion into homes, a potentially significant risk to the public. Our Superfund Innovative Technology Evaluation and Environmental Technology Verification programs have set the global standard for demonstration and performance verification of environmental technologies. NRMRL's leadership in drinking water treatment continues to upgrade our nation's water supply and keep it secure. Our responsibility for the largest national treatment technology demonstration and education program in the history of ORD continues to set the foundation for public health protection in small water systems whose drinking water is laced with arsenic. NRMRL is a leader in establishing the science to design best management practices for watersheds. These practices will yield desired improvements to water quality and support the restoration of ecosystems. We have extensive experience in air pollution research through the development and demonstration of prevention and control technologies for key industries, electric power plants, incinerators, indoor environments, and sources of greenhouse gases. Our leadership has resulted in creating a breakthrough technology for measuring dioxin and other toxic air emissions, establishing the state of the science for mercury control, and formulating methods to measure mercury in the environment. NRMRL has pioneered work in green chemistry and life cycle analysis, providing the groundwork for a sustainable approach to environmental protection. We created the mission of homeland security research within ORD and have significantly contributed to the success of the National Homeland Security Research Center. This is who we are. This is NRMRL, and success breeds success.



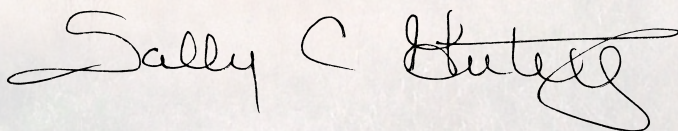


Fast forward to 2006: America goes global and discovers new directions for environmental protection. The catastrophic effects of Hurricane Katrina have given the nation a wake-up call and triggered enormous environmental and policy challenges. EPA recognizes that an intricate web of regulatory and voluntary programs has evolved; NRMRL sees the challenge of cross-media effects and recognizes the need to put the pieces together. Sustainability is seen as a potential path forward.

What a great time to be director of this amazing research organization! It's a time of enormous challenge and change. Funds and people are in short supply. Despite this, I see opportunity for us everywhere I look and with whomever I talk. EPA, the nation, and the world are interested in us and what we know. We have excellent connections and productive collaborations, and are great partners. I believe NRMRL stands uniquely poised to help EPA and, yes, the world take on the next set of major environmental challenges. We are at the forefront of EPA's commitments to environmental sustainability and environmental technologies, and we will deliver results that save the environment, save millions in compliance costs, and create economic prosperity.

EPA has entrusted NRMRL to bring about technological and engineering solutions to address the problem of aging water and wastewater infrastructure. Our work in wastewater peak flow blending will establish the scientific basis for future policy deliberation. NRMRL is in a cooperative partnership to bring great science to near roadway exposures. We've been asked to lead a major effort with the Office of Water to advance nutrient trading via wetlands. We are exploring the potential of nanotechnology in risk management approaches to environmental protection. NRMRL has completed the architecture for sustainability science, working with EPA headquarters staff. And we're bringing sustainability science to real-world situations such as those in the San Luis Valley in the western United States.

After a yearlong process, we've established the architecture, this NRMRL Strategic Plan 2007–2012, that will guide us through our next era of success. The plan is only the beginning though. As we take the next step to implement the plan, we will ask each division (including the Office of the Director), branch, program, and individual to make significant and measurable commitments to ensure that this plan is a success. I am committed, as is the entire management team, to reach our ambitious goals. I look forward to the next five years with great enthusiasm. I can't wait to tell the stories in 2012.



Sally C. Gutierrez, Director  
NRMRL





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## LIST OF ACRONYMS

BOSC .....	Board of Scientific Counselors
COOP .....	Continuity of Operations Plan
CRADA.....	Cooperative Research and Development Agreement
EPA .....	United States Environmental Protection Agency
FMFIA.....	Federal Managers Financial Integrity Act
GPRA.....	Government Performance Results Act
GPS .....	Global Positioning System
IAG.....	Interagency Agreement
MOU .....	Memorandum of Understanding
NPD .....	National Program Director
NRMRL.....	National Risk Management Research Laboratory
OMB.....	Office of Management and Budget
ORD .....	Office of Research and Development
PART .....	Program Assessment Rating Tool
PMA .....	President's Management Agenda
RARE.....	Regional Applied Research Effort
SAB.....	Science Advisory Board







# INTRODUCTION

The National Risk Management Research Laboratory (NRMRL) Strategic Plan commits the laboratory to providing the credible research and technology information needed to advance the goals of the United States Environmental Protection Agency (EPA) to improve public health and the environment. This document defines NRMRL's plan for the next five years to elevate the laboratory to a high-performing organization that achieves significant and measurable improvement in the quality and utility of its research products and technical assistance. It communicates NRMRL's approach to prioritizing research, creating effective organizational structures and processes, and strengthening the capabilities of its workforce to achieve its vision for 2012:

*NRMRL's leadership in science and engineering is recognized throughout EPA and the environmental community as the source of responsive, objective solutions to complex multidisciplinary environmental problems.*

Within EPA's Office of Research and Development (ORD), NRMRL is a solutions-oriented research organization whose mission is to:

*Advance scientific and engineering solutions that enable EPA and others to effectively manage current and future environmental risks.*

## Plan Development

This plan replaces NRMRL's 1999 strategic plan. The development of this plan was driven by several factors:

- The environmental problems for which NRMRL is expected to find solutions are multimedia (i.e., they involve air, ground water, surface water, soil, and sediment), increasingly complex, and often less publicly visible.
- Newer areas such as sustainability, brownfields redevelopment, computational toxicology, nanotechnology, and socioeconomic measures must offer improved and more cost-effective ways to reduce pollution.
- Core competencies must be enhanced to assist in the aftermath of events such as the attacks on September 11, 2001, and Hurricane Katrina so that NRMRL can deliver prompt technical assistance.
- NRMRL's research relevance and outcomes must successfully pass the scrutiny of EPA's Science Advisory Board (SAB), the Board of Scientific Counselors (BOSC), and the Office of Management and Budget's (OMB's) application of the Program Assessment Rating Tool (PART).
- NRMRL must establish an enhanced culture of collaboration both within the laboratory and beyond in order to provide comprehensive solutions to problems that require multi-disciplinary and integrative approaches.
- Even with a reduced research budget and reduced staff levels, NRMRL must continue to be relevant and make significant impacts.

A planning group of NRMRL employees representing management, technical personnel, and administrative staff worked for several months to create this plan. With the expert guidance and advice of strategic planning and organizational development consultants, the group analyzed NRMRL's strategic opportunities within EPA and ORD in the context of the changes taking place in environmental science and engineering, management practices, and the world in general (see Appendix A, Trends). The analysis led the group to develop five strategic goals that are at the heart of this plan and will guide laboratory action for the next five years:

### **Goal 1: Environmental Solutions**

Increase and improve scientific and engineering innovation and leadership to provide solutions to important environmental problems.

### **Goal 2: Marketing**

Increase the impact, recognition, and research capacity of NRMRL.

### **Goal 3: Collaboration**

Improve collaboration to achieve quality, value-added, and recognized products and services.

### **Goal 4: Organization**

Improve organizational effectiveness and efficiency.

### **Goal 5: Workforce**

Develop a mission-focused, dedicated, and flexible workforce.

The planning group identified specific outcomes for each goal and produced an array of strategies to achieve those outcomes. Performance indicators were established for evaluating progress toward the outcomes. While the five strategic goals are fixed, NRMRL's progress toward achieving the goals will require ongoing evaluation and adjustments.

As a guide for NRMRL's workforce, this plan establishes the tenets by which the laboratory will structure its actions. It also specifies the need for closer working relationships with partners and clients such as other ORD laboratories, EPA program offices, EPA regions and states, tribes, other federal and private research organizations, and the private sector. For NRMRL employees, it sets forth ways for individuals to understand their roles in achieving the strategic goals. For NRMRL clients, this plan identifies opportunities for developing collaborative research throughout EPA. This synergy will create the understanding needed to solve key environmental problems.

NRMRL's strategic plan upholds the goals of both EPA and ORD. EPA's strategic plan calls for regulatory and voluntary measures to achieve cleaner air; cleaner and safer water; remediated and revitalized contaminated land; healthy people, communities, and ecosystems; and compliance and environmental stewardship. ORD's strategic plan looks for



organizational excellence in order to support EPA's mission, to be a high-performing organization, to be a leader in the environmental research community, to integrate environmental science and technology in order to solve environmental problems, and to anticipate future environmental issues.

## NRMRL's Values

NRMRL is an organization whose level of proficiency will be raised to high performance in the coming years. To do this, NRMRL will find strength in its value system. Our core values provide a deeper perspective on our strategic aspirations:

- **We value our environment.** We work at EPA because we believe that the prosperity and security of our families, our country, and our world depend on the health of the natural systems that surround us.
- **We value the trust and respect of the American people.** As a part of the federal government, we understand that the work we do is for the public good and we must meet the high expectations the American people hold for public servants.
- **We value our research.** We take pride in

our work and are driven to conduct research that is scientifically sound and meets quality assurance standards.

- **We value our people.** Our ability to find solutions to environmental problems and to communicate the results depends on a talented and dedicated workforce with diverse backgrounds and perspectives. We understand that to be trusted and respected, we must first trust and respect each other.

As part of the Office of Research and Development, NRMRL follows ORD's leadership and adheres to ORD's principles. These principles, described in Appendix B, are aligned with NRMRL's core values and are embodied in our vision, goals, and strategies.

## Meeting EPA's Strategic Goals

As the laboratory for risk management research within ORD, NRMRL's focus is on environmental problem solving. As such, NRMRL's research portfolio spans EPA's five strategic goals, as below.

EPA Strategic Goal	NRMRL Research Areas
1. Clean Air and Global Climate Change	National Ambient Air Quality Standards (control of particulate matter and ozone) Indoor and ambient hazardous air pollutants Adaptation to climate change Technology assessment and scenarios for implementation
2. Clean and Safe Water	Regulated and unregulated drinking water contaminants Water infrastructure, water distribution, and source water protection Water quality restoration and protection, integrated watershed management, nutrient trading
3. Land Preservation and Restoration	Site cleanup, land revitalization Hazardous wastes, resource management
4. Healthy Communities and Ecosystems	Toxic substances Ecosystem restoration Biotechnology, global climate change Endocrine disruptors Control and characterization of indoor air contaminants
5. Compliance and Environmental Stewardship	Environmental technology and chemistry Sustainable systems management, sustainability metrics Decision support tools, models, and methodologies

The sections that follow delineate what NRMRL will do to achieve its five strategic goals. A discussion about each goal is presented, followed by expected outcomes, strategies to achieve the outcomes, performance indicators needed to measure the progress toward outcomes, external factors that can affect progress, and management challenges that may require bold action.

## **Path Forward**

Upon approval of NRMRL's strategic plan, the implementation phase will begin. In coordination with each other, the Office of the Laboratory Director

and each NRMRL division will be charged with developing their own implementation plans for achieving NRMRL's goals. These implementation plans will consist of applying the ranking criteria (refer to Goal 1) to the relevant research programs, developing prioritized lists of goal strategies, and identifying specific actions needed to implement the strategies. The Office of the Laboratory Director and the divisions will select the appropriate performance measures to gauge progress.





# ENVIRONMENTAL SOLUTIONS

**Goal 1:** Increase and improve scientific and engineering innovation and leadership to provide solutions to important environmental problems

Goal 1

NRMRL's scientific and engineering leadership has been instrumental in enabling EPA's tremendous progress in protecting and improving the environment, even with significant population and economic growth. This leadership has been demonstrated repeatedly across the spectrum of environmental risk management. NRMRL continues to be committed to improving and extending its scientific and engineering capabilities. NRMRL must distinguish itself with innovation and be poised to lead the scientific and engineering fields in enabling EPA and other stakeholders to solve important environmental problems.

Goal 1 focuses on the technical programs NRMRL will pursue and the risk management solutions NRMRL will produce. The planning group developed clear-cut criteria to be used in prioritizing these choices. Aligning research activities with NRMRL's mission is critical to creating a high-performing organization. In the implementation phase, the criteria will be applied to all programs to prioritize existing research, initiate new research, and conclude research that has limited applicability to achieving environmental benefits or has not demonstrated adequate scientific progress.

NRMRL will support these prioritized research activities with adequate capital and expertise. For a detailed discussion of the prioritization criteria, refer to Appendix C, Research Program Prioritization. In brief, the criteria are:

**Threshold (Yes/No) Criteria**, which solicit answers to the following questions (a "no" answer disqualifies the research program):

- A. Does the program clearly support the EPA and NRMRL missions?
- B. Has the state of the science been sufficiently evaluated to define a unique NRMRL contribution and a credible path toward achieving the desired outcomes?

**Bypass Criteria**, which accept a research program or project under these conditions:

- A. Congressional directives
- B. Political considerations

**Ranking Criteria**, which are applied to a program or project by answering the following questions and assigning, for example, a high, medium, or low ranking. The ranking criteria are:

**Impact** If successful, to what extent will the program lead to outcomes with measurable positive environmental impacts?

**Alignment** How high is this work on EPA's list of priorities? To what extent is there a clearly defined client for the work?

**Resources** To what extent are existing or potential resources available to carry out the program plan?

**Advances in Science** To what extent does the work demonstrate scientific leadership through innovative, high-quality scientific inquiry that addresses high-risk environmental problems?

Goal 1 cannot be achieved in isolation; it is closely connected to the other four strategic goals. For NRMRL to achieve its vision, it must work to ensure

its research is recognized and valued (Goal 2), work in collaboration to expand its capabilities (Goal 3), streamline work processes to attain greater effectiveness and efficiency (Goal 4), and build and maintain the most effective and efficient workforce possible (Goal 5).

## Outcomes

Goal 1 has two outcomes:

1. NRMRL research is based on a sound scientific foundation for making environmental decisions.
2. Recognition of NRMRL's scientific leadership is increased.

## Strategies

**Table 1.1** shows the strategies needed to achieve each outcome.

Goal 1 Outcome	Strategies
1. NRMRL research is based on a sound scientific foundation for making environmental decisions.	<p>A. Prioritize and evaluate ongoing NRMRL research areas by applying prioritization criteria to ensure that current EPA needs are being fulfilled and future EPA needs anticipated.</p> <p>B. Use objective internal and external review panels to periodically evaluate research progress and direction.</p> <p>C. Ensure NRMRL solutions are effectively represented in formulation of EPA approaches through participation in EPA regulatory workgroups.</p> <p>D. Establish, strengthen, and maintain working relationships with external expert groups to identify emerging research needs and communicate NRMRL capabilities and products.</p> <p>E. Clearly define long-term scientific core expertise.</p>
2. Recognition of NRMRL's scientific leadership is increased.	<p>A. Contribute to high-impact journals with high visibility among targeted audiences to expand recognition of NRMRL contributions.</p> <p>B. Provide technology overviews, state-of-the-science reviews, and synthesis papers to develop and communicate broader risk management perspectives and options to non-expert decision makers.</p> <p>C. Participate in leadership positions in professional organizations to identify emerging issues and promote NRMRL capabilities.</p> <p>D. Participate and lead intra-agency and inter-agency efforts with states, global organizations, and others who are organized to address and resolve environmental problems that require science and engineering solutions.</p> <p>E. Pursue research areas that have the potential for commercialization of a technology.</p> <p>F. Create a committee composed of senior NRMRL researchers to identify new research questions and opportunities.</p> <p>G. Effectively track research product use and impact.</p>

**Table 1.1**



Goal 1 Outcome	Performance Indicators
1. NRMRL research is based on a sound scientific foundation for making environmental decisions.	A. Increased application of NRMRL solutions in regulations, decisions, policy, and guidance.
	B. Number of new research programs established to address EPA needs.
	C. Increased consistency between NRMRL's research programs and the established prioritization criteria.
	D. Increased number of technology verifications and assessments.
2. Recognition of NRMRL's scientific leadership is increased.	A. Increased role in EPA nanotechnology, energy, and climate change research programs.
	B. Increased number of awards for research accomplishments.
	C. Increased invitations to scientific conferences and similar venues.
	D. Increased number of NRMRL patents that are taken through to commercialization.
	E. Increased number of Cooperative Research and Development Agreements (CRADAs) and Memoranda of Understanding (MOUs) to deliver better results.
	F. Increased number of NRMRL Small Business Innovative Research technologies that enable commercialization.

Table 1.2

## Performance Indicators

**Table 1.2** shows the performance indicators that will be used to measure progress toward the outcomes.

## External Factors

External factors can affect progress toward successfully achieving the outcomes. For Goal 1, the external factors are:

### **The Increasing Pace of Technological Change**

New technological changes, along with new environmental issues, are emerging rapidly. This puts pressure on a research organization to become versed in many new areas and to invest in the areas considered most critical for the future.

**Resource Limitations** It is impossible to invest in all possible research areas; this increases the importance of maintaining strong ties with both client offices and the scientific community and using those ties to determine the issues that are important but are not yet being addressed. Reductions in support staff and increased

administrative duties further erode the time available for research activities.

### **The Changing Regulatory Approach to Environmental Issues**

Conventional “command and control” regulatory approaches that specify technical solutions may not continue to be the primary means to solve environmental problems. Because of the increasing complexity of environmental problems, along with an emphasis on market-based solutions and changing federal research investment priorities, greater levels of partnering and cross-disciplinary collaborative approaches to problem solving are required.

### **The Increased Participation in Environmental Research and Development**

For some issues such as climate change, there are large, well-established government research efforts. Even though EPA accounts for only a small part of the federal environmental research budget, it is critical for NRMRL to identify where it can play a leadership role or an important supporting role.

## Management Challenges

Bold actions may be required to meet anticipated management challenges. For Goal 1, the management challenges are:

**The Changing Research Landscape** New technologies, the increasing pace of innovation, and greater emphasis on solutions that extend beyond strictly technical approaches—all of these will require continual evaluation of trends and adjustments in research efforts. There's no doubt research that addresses program office needs must take priority. But conducting research that is more forward-looking enables NRMRL to respond to future and unexpected problems, and provides NRMRL with the expertise necessary to be accepted as a scientific and engineering leader. Finding the right balance between these competing demands will be a continuing challenge for managers at all levels in NRMRL.

### **The Changing Government Approaches**

Responding to accountability requirements (such as the Government Performance Results Act [GPRA] and PART) is becoming increasingly

difficult because of decreasing budgets and staff levels. It will require an emphasis on personnel and organizational performance, coordination, training, and flexibility. NRMRL management will be challenged to maintain core technical capabilities while ensuring that the organization is able to respond quickly to EPA's ever-changing needs.

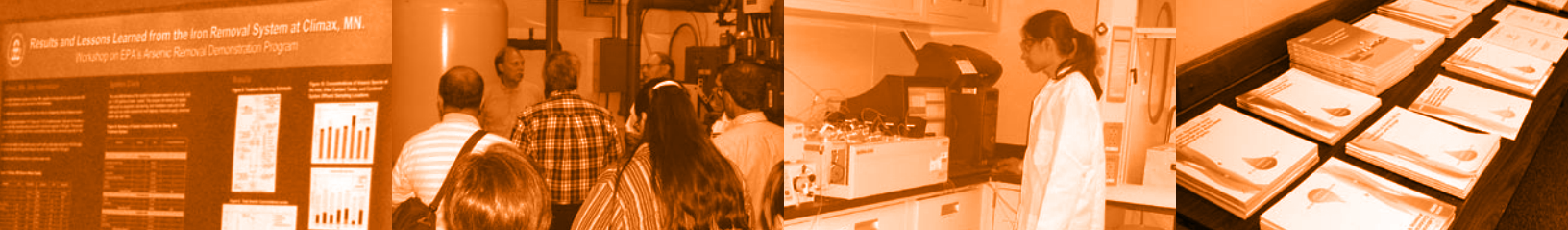
**The Changing ORD Practices** The establishment of national program directors (NPDs) has effectively created a matrix management structure in which line management is now expected to provide the capabilities to conduct the research defined by the NPDs and to ensure that the research is done on schedule and within budget.

**Laboratory Redesign** Renovating the laboratory in the Andrew W. Breidenbach Environmental Research Center will necessarily keep essential laboratory facilities off-limits to researchers in the coming years, thus creating a constraint on research capacity. EPA's Laboratory Infrastructure Review may result in further facilities changes.

*Low-Altitude Aerial Photography  
Surveying (LAAPS)*







# MARKETING

## Goal 2: Increase the impact, recognition, and research capacity of NRMRL

As a leader in advancing solutions to environmental problems and supporting scientifically sound decision making, NRMRL will promote and communicate its capabilities and services to existing and potential clients, stakeholders, and communities. To accomplish this, NRMRL will implement a comprehensive, far-reaching marketing plan to foster support for its research programs. Because the marketing plan will promote greater NRMRL recognition, it will serve to sustain current work and create future work. NRMRL will leverage resources and expertise with other collaborators and beneficiaries to keep high-impact and valuable research programs operating.

The foundation for the success of Goal 2 is embedded in the laboratory's unique research and technical support programs, which are critically and objectively peer reviewed. NRMRL's divisions and programs enhance the organization's reputation through their specialized research excellence and scientific contributions.

To heighten its presence in the scientific community, NRMRL's successes will be communicated in ways that vigorously convey research outputs and their connection to outcomes. This will require establishing effective communication with OMB, key agency programs and regions, tribes, collaborators, and the public. By establishing strategic alliances

that facilitate resource and expertise sharing with others, by increasing its innovation and leadership (Goal 1), and by improving strategic collaboration (Goal 3), NRMRL will position itself to serve as a premier science organization.

Success for communication and outreach will be achieved when NRMRL:

- Develops the appropriate mix of communications staff within the divisions and the Office of the Director
- Executes an effective communications plan with solid performance measures
- Participates in the most respected technical conferences
- Builds and strengthens its Web presence in the user community

These fundamental activities will increase NRMRL's recognition and reputation among those who make research investment decisions. Support from these decision makers is critical if NRMRL is to maintain the resources necessary to conduct highly valued research, provide relevant products and services, and foster a work environment that attracts talented and highly motivated professional staff.

## Goal 2

## Outcomes

Goal 2 has two outcomes:

1. Research resources are increased.
2. Organizational recognition from government, regulators, industry, peers, and the public is increased by demonstrating the impact of NRMRL's research in solving important environmental problems.

## Strategies

**Table 2.1** shows the strategies needed to achieve each outcome.

## Performance Indicators

**Table 2.2** shows the performance indicators that will be used to measure progress toward the outcomes.

## External Factors

External factors compel management to identify key stakeholders and clients, evaluate high-priority research programs, and assess research outcomes and impacts. An options analysis for improving outcomes and impacts might include the crosswalk shown in **Table 2.3**.

Goal 2 Outcome	Strategies
1. Research resources are increased.	<p>A. Develop mechanisms that promote understanding and interest in NRMRL's current capabilities, past successes, and future directions.</p> <p>B. Identify and pursue funding opportunities with potential internal/external clients and collaborators.</p> <p>C. Establish channels of communication with Congress, OMB, and the public to convey the impacts and benefits of NRMRL's research and its ability to solve environmental problems.</p> <p>D. Strengthen relationships with program offices and EPA regions by identifying their needs and priorities.</p> <p>E. Identify future trends and directions to conduct leading-edge research on long-term environmental protection issues.</p> <p>F. Identify new customers and mutually beneficial partnerships.</p> <p>G. Market NRMRL facilities, services, and resources to potential users and third parties when their interests are complementary to NRMRL's research programs.</p> <p>H. Assess progress and measure success of collaborative efforts through surveys.</p>
2. Organizational recognition from government, regulators, industry, peers, and the public is increased by demonstrating the impact of NRMRL's research in solving important environmental problems.	<p>A. Develop and promote NRMRL's unique identity.</p> <p>B. Develop a communications and outreach plan.</p> <p>C. Strengthen Web presence by keeping information current and relevant.</p> <p>D. Showcase NRMRL's research products and its partners in international risk management symposia.</p> <p>E. Strengthen technical support to regions.</p> <p>F. Publish in the public press to increase public awareness and recognition of NRMRL's and EPA's contributions.</p>

**Table 2.1**



Goal 2 Outcome	Performance Indicators
1. Research resources are increased.	<p>A. Increased resources for high-priority NRMRL research.</p> <p>B. Increased use of CRADAs, Interagency Agreements (IAGs), Strategic Environmental Research and Development Programs, and Regional Applied Research Efforts (RAREs).</p> <p>C. Increased number of customers accessing NRMRL's core competencies.</p> <p>D. Increased number of outside users.</p> <p>E. Increased amount of in-kind support.</p>
2. Organizational recognition from government, regulators, industry, peers, and the public is increased by demonstrating the impact of NRMRL's research in solving important environmental problems.	<p>A. Increased use of NRMRL research data for environmental decision making by program offices and regions; increased number of documented regulations and rule-making activities based on NRMRL's research.</p> <p>B. Increased peer-reviewed publications, patents, and technology commercialization, with applied outcomes measured.</p> <p>C. Increased interactions with the media.</p> <p>D. Increased requests from clients for NRMRL expertise.</p> <p>E. Increased requests for technical support from internal/external clients and technology vendors.</p> <p>F. Increased national and international collaborations with strategic partners.</p> <p>G. Increased invitations to participate in national and international meetings (e.g., as session chairs, conference chairs, plenary speakers, and steering committee members).</p> <p>H. Increased participation in inter-agency and intra-agency working groups.</p>

Table 2.2

Stakeholder	Program Evaluation Measure	Evaluation Criterion	Desired Outcome/Impact
Congress	Public opinion	Solutions	Funding increase
OMB	PART	Outcomes	"Effective" rating
EPA Program Office	EPA strategic goals and targets	Products, outreach	Usefulness to EPA decision making
ORD	Multi-Year Plan annual performance goals and measures	Delivered on schedule	Sound science
Regions, States	Technical support	Application	Sound decisions
Federal Agencies	IAGs and MOUs	National priorities	Collaborations that achieve results
Industry	Technology verification	Innovation	Commercialization
Scientific Community	BOSC, division peer reviews	Sound science and outcomes	Endorsement

Table 2.3

For Goal 2, the external factors are:

**Sustaining Relationships** The regions, states, and tribes have been key stakeholders and NRMRL clients who provide resources for NRMRL's research through programs such as RARE. These relationships give principal investigators and technology transfer specialists the opportunity to provide much needed guidance in implementing EPA programs. More often than not, EPA regions will pull together to provide funding for a single research project to address an issue of mutual concern. There is ample opportunity for NRMRL to apply its expertise; in fact, numerous synthesis documents have been completed because of these productive relationships.

**Marketing Collaboration** Establishing and promoting external collaborations with other federal agencies, private industry, academia, and local communities are vital for NRMRL's future. NRMRL can garner respect and recognition by partnering with other organizations to move environmental research and technical support forward. Partnering brings additional expertise and resources to bear on important issues and enables NRMRL's partners to see meaningful results through measurable improvements in the environment. By working together, NRMRL maximizes EPA's ability to achieve its goals.

## Management Challenges

Bold actions may be required to meet anticipated management challenges. For Goal 2, the management challenges are:

**Increased Competition** Increased competition from similar research organizations (including the federal government, academia, and private foundations) makes it increasingly important for NRMRL to demonstrate its uniqueness, its specialized contribution, and its significant impact so that its research capacity can grow. Leveraging resources and expertise through collaborations is critical.

**Budgeting Process** The budgeting process often places priority on visible, short-term issues. Such highly visible emergencies and events are emphasized in the priorities established through Congressional mandates or program office and regional needs. This approach conflicts with the stability needed over the long term to develop high-quality scientific results. However, planning and accountability measures related to the GPRA have been incorporated into multi-year planning, which sustains and enhances long-term research efforts that support laboratory core competencies.

*Water Distribution System Simulator  
at the Test and Evaluation Facility in  
Cincinnati, Ohio*







# COLLABORATION

**Goal 3:** Improve collaboration to achieve quality, value-added, and recognized products and services

Solutions to complex, multimedia (i.e., air, ground water, surface water, soil, sediment), large-scale problems require the skills of scientists, engineers, and subject matter experts from a variety of disciplines and with various competencies. Collaboration, a mutually beneficial relationship entered into in order to achieve a common goal, enhances NRMRL's ability to adapt to future challenges. In its draft "EPA 2006–2011 Strategic Plan: Charting Our Course,"<sup>1</sup> EPA made commitments to collaborate when doing so would produce more comprehensive results than would be achieved by working alone. Increasing labor and operational costs necessitate leveraging our expertise and resources to the greatest extent possible. Thus, collaboration is desirable and necessary for the long-term viability of NRMRL's research programs. It will help NRMRL to be a vibrant and recognized provider of environmental solutions.

## Outcome

Goal 3 has one outcome: Collaboration with internal and external organizations is improved.

<sup>1</sup> [http://www.epa.gov/ocfo/plan/06strat\\_plan.pdf](http://www.epa.gov/ocfo/plan/06strat_plan.pdf)



## Strategies

**Table 3.1** shows the strategies needed to achieve the outcome.

Goal 3

Goal 3 Outcome	Strategies
I. Collaboration with internal and external organizations is improved.	<p>A. Actively pursue and implement effective and efficient mechanisms that enable both internal and external collaboration to further environmental goals.</p> <p>B. Expand development of technology partnerships with industry, using mechanisms such as CRADAs and the Environmental Technology Verification program.</p> <p>C. Develop a streamlined process that addresses administrative and legal requirements for collaboration.</p> <p>D. Foster knowledge of available collaboration tools by communicating what is available, how to acquire access, how these tools can be used, and whom to contact for information.</p> <p>E. Keep information in databases current to enable internal collaboration.</p> <p>F. Develop a means for effective interactions between scientists in different NRMRL organizational units and locations.</p> <p>G. Use surveys to assess progress and measure success of collaborative efforts.</p> <p>H. Improve documentation and tracking of collaborative research efforts.</p> <p>I. Encourage problem solving in teams, capitalizing on cross-organizational resources and expertise from other laboratories, centers, program offices, regions, and stakeholders (e.g., agencies, states, industry, and academia).</p> <p>J. Notify internal and external stakeholders of collaborative opportunities (e.g., sabbaticals to academia and research institutions, details to other ORD laboratories and program offices, post-doctoral programs, and visiting scientist programs).</p> <p>K. Improve collaborative skill sets, identify research needs, and establish potential for collaboration in specific technical areas through use of workshops, scientist-to-scientist meetings, and symposia.</p>

**Table 3.1**

## Performance Indicators

**Table 3.2** shows the performance indicators that will be used to measure progress toward the outcome.

## External Factors

External factors can affect progress toward successfully achieving the outcome. For Goal 3, the external factors are:

**Reduced Competition** Formation of and funding for cross-organizational EPA teams to address specific technical problems will reduce competition for available resources and eliminate redundant efforts. Successful collaboration may be enhanced through the involvement of stakeholders.

**Incorporating Others** The continued direct involvement of regional and program offices in planning research will ensure that our clients' needs are clearly recognized and addressed. The direct involvement of other laboratories and centers in planning and conducting research will improve the quality and usefulness of the products. Multi-year plans, annual performance goals, and annual performance measures will reflect collaborative efforts. Collaboration at this level will require full buy-in from management and cooperation from staff with organizations outside of NRMRL. In the absence of formation of EPA-wide teams, individual principal investigators from NRMRL will be encouraged to form ad hoc teams.



# Management Challenges

Bold actions may be required to meet anticipated management challenges. For Goal 3, the management challenges are:

**Staffing** Having available resources to support sabbaticals, details, post-doctoral positions, and visiting scientists—in light of other resource demands—will be a challenge.

**Legal and Administrative Requirements** Understanding and planning for the legal and administrative requirements that are involved in collaborations are management challenges. For example, use of EPA facilities calls for written agreements requiring review by EPA legal counsel. The reviews affect the time frame for initiating these collaborations.

**Providing Focus** Having the resources to support attendance at scientific meetings, conferences, professional symposia, and technical seminars (all of which provide a venue for initiating collaboration) will be a challenge. NRMRL reaps great benefits by interactions with scientists from other ORD laboratories, industry, academic institutions, and state and local

agencies. In addition, these meetings provide opportunities for NRMRL researchers from different geographical locations to interact and initiate collaboration. Typically, these interactions focus on the scientific and technical questions and approaches rather than on programmatic needs, and can be used to foster both formal and informal partnerships.

**Identifying Expertise Through Collaborative Tools** Tools to facilitate collaboration, such as ORD's Biosketch database, can be useful for finding others who could serve as collaborative partners. Completeness of this information can directly benefit personnel and research programs. However, keeping databases up to date is a management challenge because of competing demands on scientific staff.

**Stimulating Users** Collaboration is fostered by the recognition of outstanding research that itself directly benefited from collaboration. Collaboration will not be encouraged simply for the sake of collaborating. Rather, it must be used as an enabling process where it can benefit a project or produce a mission performance outcome.

Goal 3 Outcome	Performance Indicators
I. Collaboration with internal and external organizations is improved.	A. Increased customer satisfaction with collaborative efforts.
	B. More environmental solutions based on collaborative systems approach.
	C. Increased funding for and number of collaborative efforts fostered by CRADAs, IAGs, and other external mechanisms.
	D. Increased funding for collaborative research teams.
	E. Increased degree to which collaboration is included in promotion policies, performance standards, and awards.
	F. Improved quality of products (such as more publications in high-quality journals) and services fostered by collaborative efforts.
	G. Increased demand for workshops, scientist-to-scientist meetings, and symposia that foster collaboration.
	H. Increased use of and demand for collaborative tools.

Table 3.2

**Educating Users** Users are often unaware of the existence of collaborative tool sets or are untrained in using them. Furthermore, sharing information electronically can be limited by information security concerns or the information technology infrastructure. Collaboration requirements must be shared with ORD

information technology planners so that the requirements can be incorporated into scientific research architecture and EPA's enterprise architecture. It is imperative that communication mechanisms be in place so that users know where to go for information.

**Administrator Stephen L. Johnson honors EPA employees for their outstanding efforts during the aftermath of Hurricanes Katrina and Rita in 2005.**





# ORGANIZATION

## Goal 4: Improve organizational effectiveness and efficiency

While working to protect public health and the environment, EPA and NRMRL are committed to good stewardship of public funds. For NRMRL, this commitment means the laboratory must operate as effectively and efficiently as possible. This will result in the development and advancement of environmental solutions that contribute to achieving the EPA mission while meeting our stewardship obligation.

A critical activity will be creating additional business process efficiencies. Streamlining or centralizing administrative and communication procedures, both internal and external, is essential to improving organizational efficiency. But organizational efficiency is not “doing more with less”; rather, it’s benefiting from the talents of NRMRL’s staff. NRMRL aims to do “more with more,” that is, to do more high-quality, high-value technical and administrative work by relying more on the skills and creativity of NRMRL’s staff.

### Outcomes

Goal 4 has two outcomes:

1. The effectiveness of NRMRL’s operations is increased.
2. Organizational efficiencies that provide consistent administrative and technical support are increased.

### Strategies

**Table 4.1** shows the strategies needed to achieve each outcome.



*Trimble Global Positioning System (GPS)*

Goal 4



Goal 4 Outcome	Strategies
1. The effectiveness of NRMRL's operations is increased.	<ul style="list-style-type: none"> <li>A. Improve methods for tracking resources that identify outputs and outcomes to ensure that resources are used effectively.</li> <li>B. Improve management controls associated with meeting GPRA and multi-year plan deliverables.</li> <li>C. Improve research program design by addressing PART requirements.</li> <li>D. Institute a management procedure to ensure and track consistent implementation of NRMRL's quality assurance system.</li> <li>E. Improve management controls for NRMRL's fiscal administration.</li> <li>F. Improve management controls for NRMRL's records management system.</li> <li>G. Improve management controls for NRMRL's health and safety requirements.</li> <li>H. Issue NRMRL annual reports.</li> <li>I. Evaluate and implement Continuity of Operations Plans (COOPs) for all NRMRL locations.</li> <li>J. Improve management controls for compliance with ORD clearance process.</li> </ul>
2. Organizational efficiencies that provide consistent administrative and technical support are increased.	<ul style="list-style-type: none"> <li>A. Develop implementation plans for organizational units and link the plans to NRMRL's Strategic Plan.</li> <li>B. Establish and implement standard practices for providing services.</li> <li>C. Provide current information on finances, staffing, communications, and research progress.</li> <li>D. Regularly communicate with the ORD and EPA information technology communities to relay telecommunication, and hardware and software needs; take advantage of upgrades and new technology.</li> <li>E. Develop and implement an internal laboratory communications plan.</li> <li>F. Publicize methods, tools, and efficiencies that lead to best practices within NRMRL.</li> <li>G. Improve tracking of research products; implement unified Environmental Information Management System, Science Inventory, and the Technical Information Management System.</li> </ul>

Table 4.1

## Performance Indicators

**Table 4.2** shows the performance indicators that will be used to measure progress toward the outcomes.

## External Factors

External factors can affect progress toward successfully achieving the outcomes. For Goal 4, the external factors are:

**Driving Forces** The President's Management Agenda (PMA)<sup>2</sup> calls for management reform

in government based on the principle that government should be citizen centered, results oriented, and market based. EPA's strategic plan discusses its commitment to the PMA. Of the PMA's five government-wide goals, four are related to increasing organizational effectiveness and efficiency: (1) competitive sourcing, (2) expanded electronic government, (3) improved financial performance, and (4) budget and performance integration. The fifth goal, strategic management of human capital, is discussed in Goal 5 of this plan.

**Competitive Sourcing** EPA is committed to increasing efficiency through competitive

2 <http://www.whitehouse.gov/omb/budget/fy2002/mgmt.pdf>

Goal 4 Outcome	Performance Indicators
1. The effectiveness of NRMRL's operations is increased.	A. Increased percentage of planned milestones (such as annual performance measures and GPRA deliverables) met.
	B. Increased compliance with management integrity requirements.
	C. Improved PART scores.
	D. Initiated and maintained performance monitoring reports.
	E. Greater ease of access to information used for assessing management controls (such as budget, compliance with quality assurance, health and safety, and records management).
	F. Finalized COOPs.
	G. Improved recognition and remediation of Federal Managers Financial Integrity Act (FMFIA) weaknesses.
2. Organizational efficiencies that provide consistent administrative and technical support are increased.	A. Increased consistencies between performance of NRMRL's Divisions and NRMRL's Strategic Plan.
	B. Increased development and implementation of practices for providing consistent and streamlined services.
	C. Reduced administrative burden on technical staff.
	D. Sustained success in "Competitive Sourcing" competitions for support functions, as measured by efficiency/cost ratio.
	E. Improved internal communications.
	F. Clearer understanding of roles and responsibilities.

Table 4.2

sourcing. NRMRL is committed to winning these competitions in order to achieve the best value for the government and to create the most efficient organization possible.

**E-Government Initiatives** E-Gov uses improved Internet-based technology for easier interaction with the government. EPA is pursuing opportunities to leverage electronic tools and capabilities to improve overall performance, cost efficiency, accountability, and accessibility to services and information. Improved electronic processing will contribute to streamlining business processes.

**Improving Financial Processes** EPA and NRMRL support high standards of integrity for financial performance and effective internal controls that improve performance in accordance with FMFIA. NRMRL is committed to using management controls that ensure the protection of our

programs, operations, and functions from waste, fraud, abuse, and mismanagement.

**Integrating Budget and Performance** Linking EPA performance measures to budget submissions and to rewards and performance systems is essential for achieving better performance, more informed decision making, increased accountability for results, and more transparent and comprehensive reporting of environmental results. NRMRL is committed to the performance necessary to achieve the goals of this strategic plan and will do so through annual implementation and performance plans. Every individual will understand how his or her work supports the organization's mission and strategic goals. Commitments made in ORD's multi-year plans will be an integral part of NRMRL's annual performance plans.

## Management Challenges

Bold actions may be required to meet anticipated management challenges. For Goal 4, the management challenges are:

**Increasing Requirements** Having to meet an increasing number of requirements and having to respond to increasing oversight are significant management challenges for NRMRL, ORD, and EPA. Preparing for PART and BOSC reviews requires that significant levels of labor be directed away from conducting research. In addition, the roles and decision-making authority of NRMRL's managers are changing because of the new NPDs in ORD.

**Impending Changes** Changes in ORD's administration, service delivery, and information technology will influence how NRMRL does

business. EPA has been moving toward centralizing services; it is anticipated that this trend will be observed in ORD and in NRMRL.

### **Responsiveness to Parent Organizations**

Reacting to unanticipated requests from superiors or a parent organization while continuing to successfully complete the work at hand is a management challenge. Calls for information often create an unplanned burden on the workforce; this hampers efforts directed toward being efficient and effective. Organizational efficiency will be improved by implementing processes that move NRMRL toward a more proactive posture.

*EPA Research Triangle Park,  
North Carolina*







# WORKFORCE

## Goal 5: Develop a mission-focused, dedicated, and flexible workforce

NRMRL can be successful at providing solutions and providing quality assistance to others only with an exceptional staff that includes scientific and engineering, administrative, and managerial professionals. NRMRL is developing a plan for ensuring the right skills are in the right jobs in the right places at the right time to effectively carry out its mission and to be more efficient in doing so.

NRMRL's path forward is to attract and retain the appropriate talent to ensure the laboratory is a premier risk management research organization. Our employees are our biggest asset. Without mission-critical skill sets, NRMRL will not be able to carry out its mission. But by hiring, retaining, and developing the right talent, NRMRL will be the "employer of first choice" in a highly competitive marketplace. To fulfill its current and future commitments, NRMRL will ensure that staff members are properly trained and that workforce outcomes will be met.

### Outcomes

Goal 5 has two outcomes:

1. Skill mix is improved.
2. Performance and recognition system is improved.



*Anaerobic Glove Box*

### Strategies

**Table 5.1** shows the strategies needed to achieve each outcome.

Goal 5 Outcome	Strategies
1. Skill mix is improved.	A. Evaluate core competencies and develop a staffing/succession plan.
	B. Promote career development and training; retrain existing staff for acquiring new skills, when necessary.
	C. Create a culture that encourages learning and professional growth.
	D. Hire adaptable and versatile staff through unique internal and external staffing processes (such as staff and management rotations, details, and temporary assignments under the Intergovernmental Personnel Act).
	E. Support principal investigators with sufficient staff (e.g., post-doctorates and technicians).
	F. Promote visiting scientists and staff sabbaticals to enhance cross-organizational ties and foster new perspectives.
	G. Develop and implement a Diversity Action Plan.
2. Performance and recognition system is improved.	A. Establish common metrics to align performance standards and awards with NRMRL strategic goals.
	B. Use and communicate award systems, ensure timely feedback on awards, and improve tracking of awards.
	C. Develop a means to link administrative staff efforts to research accomplishments, and recognize those efforts.
	D. Use the 360 degree feedback evaluation process.
	E. Foster a culture in which all staff members are treated professionally and with respect. Encourage mentoring, informal information exchange, and communication.
	F. Develop a laboratory-wide career competency plan.

Table 5.1

## Performance Indicators

Table 5.2 shows the performance indicators that will be used to measure progress toward the outcomes.

research resources may discourage the best individuals from actively considering EPA or ORD employment. Creative mechanisms to offset these forces will need to be identified and implemented.

## External Factors

External factors can affect progress toward successfully achieving the outcomes. For Goal 5, the external factors are:

**Limiting Mechanisms** Government personnel regulations and resource constraints can limit NRMRL's ability to adequately compensate and reward staff.

**Competing for Talent** NRMRL is faced with increasingly intense competition for the best individuals in their field. Federal controls on pay levels and the growing concerns over

## Management Challenges

Bold actions may be required to meet anticipated management challenges. For Goal 5, the management challenges are:

**Aging Workforce** NRMRL's current workforce is aging. Within three to five years, more than 25 percent of NRMRL's staff will be eligible for retirement. Buy-outs and other incentives may intensify loss of critical staff. Therefore, succession planning is essential to NRMRL's continued progress.

Goal 5 Outcome	Performance Indicators
1. Skill mix is improved.	<p>A. Progress toward development of cataloged and projected skill mix with succession planning that incorporates retirements.</p> <p>B. Progress toward development and implementation of long-term training plan.</p> <p>C. Increased number of staff members participating in rotational, detail, and sabbatical assignments.</p> <p>D. Increased integration of human capital policies, systems, and strategies that monitor and evaluate emerging mission demands and related human capital challenges, all accomplished through workforce planning.</p> <p>E. Increased participation in leadership development programs.</p>
2. Performance and recognition system is improved.	<p>A. Increased use of metrics for rewards that are tied to NRMRL strategic goals and GPRA deliverables.</p> <p>B. Increased documentation of projects and deliverables for PART process.</p> <p>C. Increased emphasis for scientists to publish in high-quality journals or make presentations at high-visibility meetings, thus producing national experts and bringing increased recognition to NRMRL.</p> <p>D. Increased number of staff applying for or being nominated for awards.</p> <p>E. Increased job satisfaction and morale, as measured by appropriate survey instruments.</p> <p>F. Increased number of public and societal recognitions, appointments, and awards.</p> <p>G. Increased requests by outside organizations for specialists from NRMRL to provide expertise.</p>

Table 5.2

**Travel Impacts** Cost-saving efforts will reduce the number of scientific and engineering meetings in which NRMRL can participate. This can lessen NRMRL's ability to effectively disseminate research in an active forum; it can also lead to staff discouragement. Yet, the ability to travel for needed training will be essential in developing the skill sets necessary to execute NRMRL's mission.

**Hiring the Right Expertise** NRMRL is faced with a hiring dilemma: depth versus breadth. Is it better to hire a highly developed expert with the knowledge, skills, and abilities for very defined topics or to hire a person with broader expertise that can be applied across a number of potential research requirements? Furthermore, NRMRL must decide on the merits of recruiting within different position categories (e.g., scientist/engineer, technician, administrative or management professional).

**Creating Workforce Efficiency** Under the government's application of Most Effective Organization,<sup>3</sup> NRMRL may continue to face reduced staffing.

#### **Programs to Coordinate and Maximize Training Funds and Resources Through Workforce Planning**

A workforce planning process is needed to ensure that NRMRL hires, retains, or contracts for the appropriate number of staff members with the competencies needed to carry out EPA's mission. NRMRL must implement planning exercises that assess by occupation and organizational unit predictive indicators of workforce effectiveness, such as the distribution of employee skills and competencies, attrition rates, projected retirement rates, and retirement eligibility.

3 <http://www.opm.gov/hr/employ/products/restruct/competitivesourcing.asp>



***Uniformity in Opportunity Access for Employees as They Prepare for New Roles Needed by the Laboratory*** NRMRL must adopt human capital and succession plans and assessments (such as those offered by the Office of Personnel Management, the Government Accounting Office, and others) that align with ORD and EPA strategies. To establish goals for the workforce, NRMRL needs to use incentives and programs such as Most Effective Organization, ORD's

multi-year plans,<sup>4</sup> OPM's Human Capital Strategy,<sup>5</sup> and the PMA. To develop a separate strategy, NRMRL can use existing programs for hiring entry level staff, such as the Federal Career Intern Program.<sup>6</sup>

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4 <http://www.epa.gov/osp/myp.htm>

5 [http://www.opm.gov/Strategic\\_Management\\_of\\_Human\\_Capital/Strategy.asp](http://www.opm.gov/Strategic_Management_of_Human_Capital/Strategy.asp)

6 <http://www.opm.gov/careerintern>

***Particulate Matter Emissions Quantification Test Chamber (PMEQTC) at Research Triangle Park, NC***





# APPENDIX A

## Trends

In developing this strategic plan, we considered the changes that have taken place all around us—politically, economically, socially, and environmentally—since the last plan was issued. Some of these changes have been dramatic, such as the terrorist attacks on September 11, 2001, the Hurricane Katrina disaster, and the rapid rise of energy prices (which has stimulated the search for renewable sources). All are having a direct effect on the environment. Other changes—in technology, in political perspectives, in environmental indicators, and in business practices—may be associated with significant new trends, although these trends are extremely difficult to predict.

Some of the changes are more difficult to capture as discrete events than those listed above but may be even more influential with respect to NRMRL's long-term future. Examples include the initial North American case of bovine spongiform encephalopathy (mad cow disease); the introduction of hybrid vehicles into the consumer market; the growing availability of broadband Internet access, wireless communication devices, and global positioning system (GPS) units; global outsourcing and economic growth; and indications of climate change.

Among scientific and technological changes that bring newer environmental issues are the rise of robotics, nanotechnology, biotechnology, and genetic engineering. Ubiquitous computers, wireless communications, and GPS capabilities provide opportunities to look at monitoring in entirely different ways and also raise the expectations for information availability. Computational capabilities are beginning to address highly nonlinear systems that account for threshold, critical-point, and self-organizing behaviors. These behaviors are now being seen as keys to understanding how natural systems work and, therefore, how to address environmental issues.

Water scarcity and the health of the supply and treatment infrastructure are now more serious issues than lack of any treatment. Reducing emissions from a broad range of small sources, such as open burning and off-road vehicles, is now a key issue facing air quality managers, whereas only a few short years ago, overcoming technical barriers to controlling emissions from coal-fired utilities was the leading concern. In some cases, international transport of air pollutants can be as important as dealing with local sources of air pollution. The amount of greenhouse gases already in the atmosphere will force us to address adaptation issues regardless of what emission mitigation policies may be adopted. The way we look at contaminated Superfund sites has undergone changes, and brownfields redevelopment requiring full participation of stakeholders has been established.

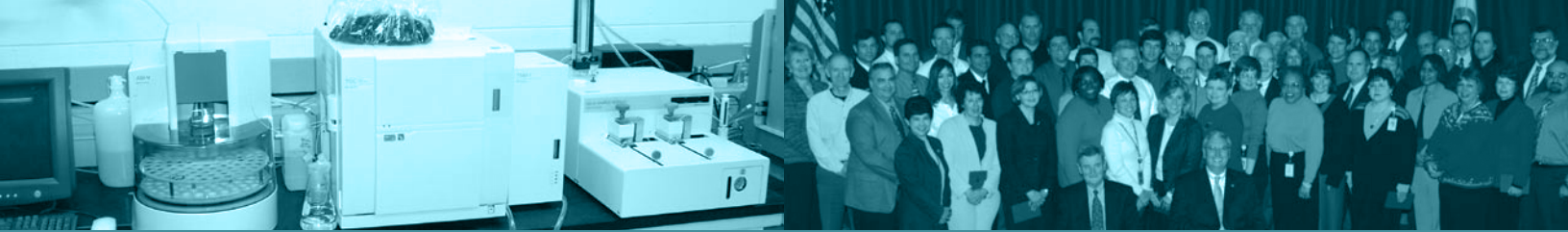


The world has moved from highly visible problems to much more subtle issues, from sources with relatively well-defined emission characteristics (and emitters) to more diffuse sources that are more difficult to find and measure, and from problems with primarily technical solutions to those that must be solved through changes in personal behavior. Fundamentally, we are facing the classic point of diminishing returns where pollution control is concerned; we have solved the less costly and easier problems and are now facing the complex and expensive ones.

Within EPA and ORD, the most visible change in the way research is planned and funded is the shift toward NPDs. Although NRMRL line managers continue to influence the technical aspects of the programs, NPDs will take the stronger role in defining the basic structure and direction of EPA's research programs. The increased complexity of problems requires that we engage in partnerships with industries, other governments (e.g., state, local, tribal, and foreign), other agencies, and other EPA laboratories and centers. The shorter time scales of technical development and the need to address the environmental consequences of unexpected events place a premium on agencies that are flexible and responsive. More partnerships, demonstrating contributions, and being accountable all call for more effective communication. Resource limitations mean that efficient use of resources is more critical than ever. It is imperative that the best business practices are used to plan, allocate, and track resources. To ensure the flexibility necessary to be successful, NRMRL must maintain core expertise in critical environmental risk management fields so that it has the appropriate expertise to address the unforeseen problems that will arise.

Some of these trends are technical and scientific. Others are more closely related to how business will be conducted. All of them represent potential challenges and opportunities for NRMRL. We realize that we cannot foresee all possibilities. We know surprises will occur and that some of them can have major impacts on NRMRL's direction. How we respond to these trends will determine our level of success over the next five years.





# APPENDIX B

## ORD Principles – Many People, One ORD

We are a unified organization built from the vision, talents, and contributions of all our people. Each of us must be both a “steward of the whole” and an advocate for each individual. We create a work environment that empowers all employees with the personal responsibility and the right to exercise their leadership skills and to achieve their full potential in support of ORD’s shared mission and priorities. Toward that end, we commit ourselves, corporately and individually, to the following principles, recognizing that we are at our best when:

1. **We are environmental stewards.** We behave, corporately and individually, in support of EPA’s mission to protect the environment and human health.
2. **We are a center of scientific excellence.** We provide reliable and responsive science that enables the best possible environmental decisions. We embrace innovation, collaboration, creativity, and risk taking as essential elements of scientific success. *I diligently use all of my talents to contribute significantly to our goals and to fulfilling our mission.*
3. **We actively seek out partnerships that advance the quality, relevance, and impact of ORD’s research.** With our partners, we meet shared environmental objectives by combining our unique talents to develop creative solutions to increasingly complex problems. We value and celebrate collaborations that enhance the quality and usefulness of our products. *I actively look beyond my own areas of expertise to see how my contributions combine with those of others to fulfill ORD’s mission.*
4. **We each exhibit leadership.** Leadership is not a position; it is an everyday behavior such as taking initiative, challenging the status quo, or expanding our vision of what is possible. Everyone has a responsibility to lead, to look for opportunities to do so, and to encourage others to lead. *I am responsible for developing and exhibiting my leadership.*
5. **We trust each other and are worthy of each other’s trust.** We base our decisions and actions on mutual trust and respect. We are honest, open, and diligent in applying our best efforts, and are jointly committed to ORD’s success. We rely on each other. We follow through with our commitments. *I am mindful of others’ trust in me, and I always behave with integrity.*



6. **We communicate openly, honestly, and clearly. Effective** and timely communication fosters a transparent culture that builds mutual trust. *I both seek the information that I need and provide the information that others need in support of a culture of open communications.*
7. **We make informed decisions at the most local level possible.** We engage in an open process that includes all relevant and affected parties. We quickly and clearly articulate decisions and their supporting rationale to all those affected. We share responsibility to implement what is decided. *I am responsible for actively participating in decision making at my level.*
8. **We embrace our diverse perspectives.** We believe every person has a fundamental worth and each person's perspective matters. Our different disciplines, backgrounds, and cultures strengthen our organization and enhance our products and outcomes. When conflict arises, we value it as an opportunity to build mutual understanding and to strengthen relationships. *I seek to understand, appreciate, and engage others' unique talents, perspectives, and contributions.*
9. **We are accountable for our actions.** We learn and understand what is expected of us as we work together to support ORD's mission. *Forever mindful that our work serves a public trust, I am dedicated to fulfilling our joint commitments and making the most of our resources.*
10. **We recognize and celebrate our accomplishments.** Our contributions to achieving ORD's mission and our living these principles are valued and celebrated. *I always recognize and celebrate others for a job well done.*



# APPENDIX C

## Research Program Prioritization

NRMRL selects research with the highest potential to improve understanding of environmental risks while addressing national and global environmental problems. Optimum return on NRMRL's research investment is obtained when scientific value, measured in terms of objective information and scientific answers with societal relevance, plays the leading role in setting priorities. Establishing research priorities across disciplines, each of which embraces a large set of scientific questions, is a major challenge.

NRMRL balances competing demands in the face of available resources and technology to chart a program that addresses the most important scientific needs. This makes optimal use of NRMRL's unique capabilities for risk management research. Thus, NRMRL's research priorities reflect scientific requirements, national priorities, and implementation realities. Scientific criteria are paramount and drive the prioritization process by defining science questions and ultimately by determining potential projects. Application of criteria may vary with specific circumstances, given the nature of the research questions being considered and the potential impact of the answers.

**Threshold (Yes/No) Criteria** Threshold criteria must be met before extensive resources can be allocated to a research program. An evaluation of the state of the science requires resources to be allocated before the program can be prioritized, so a small amount of research time is used before the threshold criteria are applied. The intent of threshold criteria is to ensure that these two fundamental questions can be answered: Is this our job? Can it be done?

**Does the program clearly support the EPA and NRMRL missions?** This question is the focus of the NRMRL mission statement on environmental solutions, and it positions EPA as our first and most important client. Research programs must therefore demonstrate that they support both the EPA and NRMRL missions. Research being conducted with and for entities other than EPA can also satisfy the NRMRL mission but cannot be considered to have met this criterion if it does not also clearly support the EPA mission.

**Has the state of the science been sufficiently evaluated to define a unique NRMRL contribution and a credible path toward achieving the desired outcomes?** Making a "unique contribution" implies identifying gaps in the state of the science. Combined with the program relevance criterion, these gaps must be in areas that are of importance to achieving EPA's mission. New program proposals must be supported by sufficient scientific analysis to demonstrate NRMRL's unique scientific contribution and lay out a credible research plan that is likely to achieve the desired





outcomes. At periodic intervals, existing programs must conduct sufficient progress reviews to demonstrate that NRMRL's efforts continue to provide unique contributions to the state of the science and that the existing or revised research plan shows a credible progression toward timely achievement of projected outcomes.

**Bypass Criteria** Congress directs research priorities that are recognized as benefiting society. Research that NRMRL is directed to conduct by Congressional mandate must be carried out. In some instances, other considerations that are largely political must also be taken into account and may override the more detailed and established criteria. Such considerations are applied or approved by the laboratory director. The following are bypass criteria:

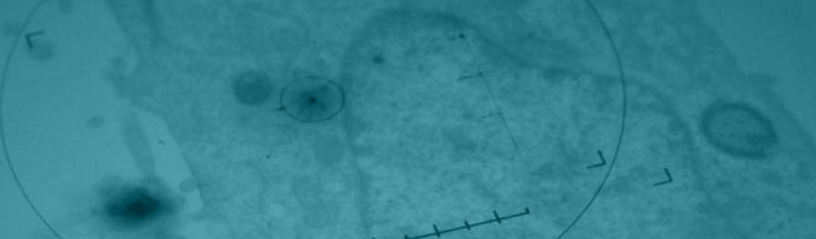
- Congressional directives
- Political considerations

**Ranking Criteria** Ranking criteria were developed to capture different aspects of research considered critical for NRMRL to accomplish its mission. Successful research programs will not necessarily, and in fact will probably not, rank high in each area. But the criteria allow anticipatory (long-term) and problem-solving (short-term) research programs to be compared as objectively as possible.

While fixed criteria cannot anticipate every possibility or every factor that can influence the development of a research portfolio, the application of these criteria will require subjective evaluation of the relative strengths and weaknesses of each program as well as discussion of the initial ranking results. The ranking criteria are:

**Impact:** To what extent can outputs and outcomes be clearly articulated? If successful, to what extent will the program lead to outcomes with measurable positive environmental impacts? In this context, “impact” does not refer to addressing gaps in the scientific understanding, but rather to making a difference to environmental outcomes. Programs that can demonstrate a clear path toward making a measurable improvement in environmental quality are ranked highest under this criterion. Programs for which the environmental improvements are uncertain or not measurable, or cannot demonstrate how environmental improvements will result from the research products, must be ranked lowest.

**Alignment:** How high is this work on EPA's list of priorities? To what extent is there a clearly defined client for the work? Through the threshold criteria (previously mentioned), programs are vetted to ensure they address work that is within the missions of EPA and NRMRL. The alignment criterion estimates the level of EPA priority for each research program. Programs that are given active support and are followed by the administrator are assigned high priority; those supported by the assistant administrator or regional administrator are slightly lower in priority; programs supported by the NPD, office, or a division are of moderate priority; and finally, programs that are supported at the branch, section, or staff level would be given low priority but are still above those programs



without any clear EPA support. “Active support” means an ongoing awareness of a program’s status and direction, direct budgetary or staff support, and support in EPA and Research Coordination Team discussions. The term implies EPA interest beyond text in research or strategic documents expressing interest in a program area.

How well does the research program demonstrate support for one or more clients for whom the work is important? Although closely related to “priority,” this criterion recognizes that important, mission-oriented research that is not a significant EPA priority can be conducted. Research conducted for a specific client outside EPA, or work that is not yet a priority at higher EPA levels, can provide valuable results applicable to addressing future high-priority EPA issues. A program that can demonstrate a clearly defined client is one that can show program-specific support from one or more specific people. Clients do not include general groups such as industry, states, or the public unless specific persons who have requested or promoted the research can be identified within the group.

**Resources:** To what extent are existing or potential resources available to carry out the program plan? Are the necessary resources (e.g., facilities, technical and administrative support, and expense and travel funding) available to conduct this research, either from EPA or other identified sources? If the resources are not clearly available, to what degree can NRMRL demonstrate the ability to obtain the necessary resources in the immediate future?

**Advances in Science:** To what extent does the work demonstrate scientific leadership through innovative, high-quality scientific inquiry that addresses high-risk environmental problems? Programs that are ranked high under this criterion can demonstrate a scientific path that fills critical research gaps. Highly ranked programs would demonstrate innovative approaches to addressing the underlying problem or to enabling research to move forward from its current state. Low-ranked research would produce incremental advances that do not enable fundamentally different approaches to addressing environmental problems. Value is placed on work that is not being conducted elsewhere, but it is more important for research to show a progression toward needed solutions than simply to be unique.

## *Many People, One ORD*

*We are a unified organization built from the vision, talents, and contributions of all our people. Each of us must be both a “steward of the whole” and an advocate for each individual. We create a work environment that empowers all employees with the personal responsibility, and the right to exercise their leadership skills and to achieve their full potential in support of ORD’s shared mission and priorities. Toward that end, we commit ourselves, corporately and individually, to the following principles, recognizing that we are at our best when:*

- 1. We are environmental stewards.*
- 2. We are a center of scientific excellence.*
- 3. We actively seek out partnerships that advance the quality, relevance, and impact of ORD’s research.*
- 4. We each exhibit leadership.*
- 5. We trust each other and are worthy of each other’s trust.*
- 6. We communicate openly, honestly, and clearly.*
- 7. We make informed decisions at the most local level possible.*
- 8. We embrace our diverse perspectives.*
- 9. We are accountable for our actions.*
- 10. We recognize and celebrate our accomplishments.*

*For more details on ORD Principles, see Appendix B within.*





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